

REMARKS

Applicants thank the Examiner for the very thorough consideration given the present application. Claims 1 and 3-16 are now present in the application. Claims 11-15 were withdrawn from consideration by the Examiner. Of the claims under consideration by the Examiner, claims 1, 8 and 16 are independent.

Claim 1 has been amended. Reconsideration of this application, as amended, is respectfully requested. Favorable reconsideration and allowance of the present application are respectfully requested in view of the following remarks.

Rejections under 35 U.S.C. § 103

Claims 1, 3-6 and 8-10 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Publication No. 2002/0073923 to Saito et al. ("Saito") in view of U.S. Publication No. 2001/0029891 to Oh et al. ("Oh"). Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness and respectfully traverse the rejection.

In order to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), the cited references must teach or suggest each and every element in the claims. *See M.P.E.P. § 706.02(j); M.P.E.P. 2141-2144.*

With regard to the rejection of claims 1, 3-6 and 8-10, while not conceding the appropriateness of the Examiner's rejection, but merely to advance prosecution of the instant application, Applicants respectfully submit that independent claim 1 has been amended to more clearly recites a substrate processing apparatus wherein the controller controls the post-processing gas supply unit to supply all of the reaction gases alternately from the exclusive supply nozzles during the post-processing which occurs after the cleaning process in which the cleaning gas has been supplied, but has been left as residue. Neither Saito nor Oh, alone or in combination, suggest this feature, and therefore Applicants submit that claim 1, and the claims dependent thereon, are patentable over Saito in view of Oh.

More specifically, claims 1 and 8 require a gas supply system controller that supplies a cleaning gas and then subsequently supplies post-processing gases for removing the undesirable elements remaining from the cleaning gases by alternately supplying all of the reaction gases

from their exclusive supply nozzles. Saito has been discussed at length before, such as in the response filed January 9, 2008, which is incorporated herein. In addition, the rejection asserts that because Saito teaches using one reaction gas as a post-processing cleaner, it would have been obvious to use them all. The Examiner now indicates in the instant Office Action that Oh has been cited and applied to suggest this feature. Oh shows an atomic layer deposition (ALD) apparatus and process wherein very thin film layers (one atom thick) may be deposited by alternate application of an activated first material gas and a non-activated second material gas. The Examiner points to paragraph [0080] of the reference in the Office Action in support of the motivation for alternately applying each of the post-processing gas supply units. A careful review of Oh reveals that it is alternately applying the deposition gases, not the post-processing gases which are applied after the cleaning gases but before substrates are placed in the container. Oh indicates in paragraph [0074] that it is possible to perform a cleaning step by introducing SF₆, which could correspond to the instant claimed cleaning gas. But Oh does not even disclose a step after the cleaning process to remove cleaning process contaminants that result from cleaning, much less teach that such an additional step would include all reaction gases alternately supplied. Therefore, it is submitted that a teaching relating to the alternate application of film forming gases in an ALD apparatus does not reasonably suggest that alternate application of all of the chemical vapor deposition CVD reaction gases would serve to remove contaminants left from a cleaning gas. Moreover, Saito is directed to chemical vapor deposition processes where the reactant deposition gases must be mixed in order to achieve the reaction necessary to form the desired layer. It would appear that any attempt to alternately supply the reaction gases in Saito would destroy the CVD process. Finally, it is submitted that the only suggestion in the record, that alternate application of all reaction gases would solve the problem of leftover cleaning residue of HF cleaning gas, comes from Applicants' own disclosure. Reliance upon Applicants' own disclosure would, of course, be inappropriate. Therefore, it is respectfully submitted that the rejection under 35 U.S.C. § 103(a) does not teach or suggest each and every element of the claim and therefore should be withdrawn.

Claim 3 requires that each of the reaction gases supplied from the post-processing gas supply unit removes the element remaining in said exclusive supply nozzles and said reaction container, and the reaction gases form a desired film in said reaction container.

The Examiner refers to paragraphs 0093, 0094, 0095 and 0097 of Saito for a teaching of these features. To the contrary, it is respectfully submitted that Saito fails to disclose that all of the reaction gases supplied from the post-processing gas supply unit remove the elements remaining in the exclusive supply nozzles and the reaction container, and the reaction gases form a desired film in said container. Therefore, for this reason as well as the reason noted above with respect to claim 1, it is submitted that claim 3 is patentable over Saito in view of Oh. Claims 4-7 depend from claim 3, and it is submitted that these claims are also patentable at least for the same reasons as claims 1 and 3.

Independent claim 8 recites a control apparatus for controlling the substrate processing apparatus such that cleaning gas is supplied from one of the supply nozzles into said reaction container at the time of cleaning, and all reaction gases used for processing a substrate are alternately supplied into said reaction container from the exclusive supply nozzles.

Neither Saito nor Oh, alone or in combination, suggest a control apparatus for controlling the substrate processing apparatus such that cleaning gas is supplied from one of the supply nozzles into said reaction container at the time of cleaning, and all reaction gases used for processing a substrate are alternately supplied into said reaction container from the exclusive supply nozzles. Therefore, for this reason it is submitted that claim 8 is patentable over Saito in view of Oh.

Claim 7 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Saito in view of Oh, and further in view of U.S. Patent No. 6,279,503 to Choi et al. ("Choi"). Choi is cited and applied for its teaching of using ClF_3 as a cleaning gas in a Chemical Vapor Deposition apparatus. Choi fails to show or suggest any of the missing features discussed above, and especially including the use of all of the reaction gases alternately supplied through their own exclusive supply nozzles during a post-processing process that occurs after the use of a cleaning gas to remove the cleaning contaminants before a new substrate is placed in the container and therefore cannot remedy the failure to teach such features with respect to claims 1, 3 and 8.

It is noted that the Examiner has cited *In re Fine* and *In re Jones* in support of the notion that the combination or modification is appropriate as long as it is taught or suggested in the prior art or knowledge generally available. Applicants do not disagree with these principles in general. But applicants insist here that this particular proposal is not taught in the applied prior art, as discussed in detail above, and the rejection fails to establish any facts that would have constituted knowledge generally available, and which would have motivated one to make the asserted modifications. The rejection further asserts that *In re Danly*, *In re Shreiber and Ex parte Masham* all support the concept that apparatus must be distinguished from the prior art in terms of structure rather than function. That is not what this case law says. This concept flies in the face of MPEP 2173.05(g) which makes clear that there is "nothing inherently wrong with defining an invention in functional terms." Moreover, these claims positively recite a "controller" and a "control apparatus" which performs very specific claimed functions which cannot properly be ignored.

Because the above discussed combination fails to show or suggest the novel features of the invention discussed above, Applicants present new claim 16 which presents a more succinct recitation of these essential features, so that the Examiner might have different phraseology to consider.

Conclusion

All objections and rejections raised in the Office Action having been properly traversed and addressed, it is respectfully submitted that the present application is in condition for allowance. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Notice of same is earnestly solicited.

Prompt and favorable consideration of this Amendment is respectfully requested.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Paul T. Sewell, Registration No. 61,784, at (703) 205-8000, in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

By 

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